Aggregation behavior of polystyrene-b-poly(acrylate acid) at the air-water interface

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Materials

Styrene (St, Tianjin Fuchen Chemical Reagents Co., A.R) was purified and vacuum-distilled prior to use. Acrylic acid (AA, Tianjin Fuchen Chemical Reagents Co., A.R) was vacuum-distilled and dehydrated. Benzyl dithiobenzoate (Advanced Technology & Industrial Co., Ltd.) was used as received. Zaodiisobutyrinitrile (AIBN, Shanghai Shanpu Chemical Reagents Co., C.R) was purified by recrystallization and dried before use. N,N-dimethylformamide (DMF, Tianjin Fuyu fine Chemical Reagents Co., A.R) was dehydrated before use.

Polymerization Process

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\begin{align*}
\text{mH}_2\text{C}=\text{CH} & \xrightarrow{\text{100°C} \ 48\text{h}} \text{mCH}_2=\text{CH} \ \text{S} | \text{C} \text{S} | \text{mCH}_2=\text{COOH} + \text{nH}_2\text{C}=\text{CH-COOH} \\
\text{AIBN/DMF} & \xrightarrow{\text{80°C} \ 30\text{h}} \ \text{mCH}_2=\text{CH} \ \text{S} | \text{C} \text{S} | \text{nCH}_2=\text{COOH}
\end{align*}
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Figure S1. The process for synthesis of PS-\textit{b}-PAA block copolymer.

Results
Figure S2. The GPC spectra of the PS maro-initiator measured in THF.

Figure S3. The FTIR spectra of the PS macro-initiator and block copolymer.

Figure S4. The $^1$H NMR spectra of block copolymer measured in DMSO.
Figure S5. Compression isotherms of the PS-\textit{b}-PAA copolymer at air-water interface, obtained from different spreading concentrations (3mg/mL, 18mg/mL)